University of Konstanz
Algorithmics Group
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Network Modeling
Winter Term 2014/2015

# Assignments $\mathcal{N}^{\underline{o}}$ 11

**released:** 21.01.2015 **due:** 27.01.2015 at 12:00h

## Task 1: Time-homogeneity – R task **10 points**

Let us consider the data collected by A. Knecht (4 adjacency matrices + gender) and a specification of the SAOM including edges, reciprocity, transitive triplets, ego covariate, alter covariate, and same gender. Last week we check for heterogeneity using a heuristic procedure.
Use the `sienaTimeTest` function in Rsiena in order to properly test if there is heterogeneity.

a) Interpret the result of the joint significance test of time heterogeneity

b) Which statistics are time-dependent?

c) Include time dummy variables for reciprocity, estimate the model and comment your results.

## Task 2: Goodness of fit – R task **10 points**

Let us consider the data collected by A. Knecht, and in particular the second and the third observations. Given a specification of the SAOM including edges and reciprocity, evaluate the goodness of fit of the model using the function `sienaGOF`.

- Save and send us the outcome of this procedure and comment your results.
- Add at least 4 (network or attribute-related) statistics in order to improve the GOF.